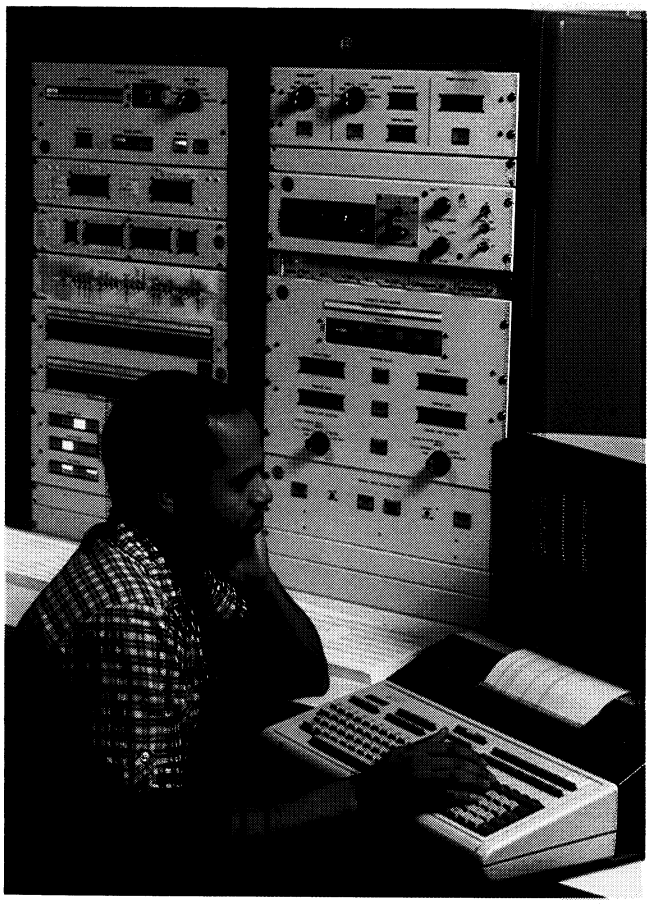
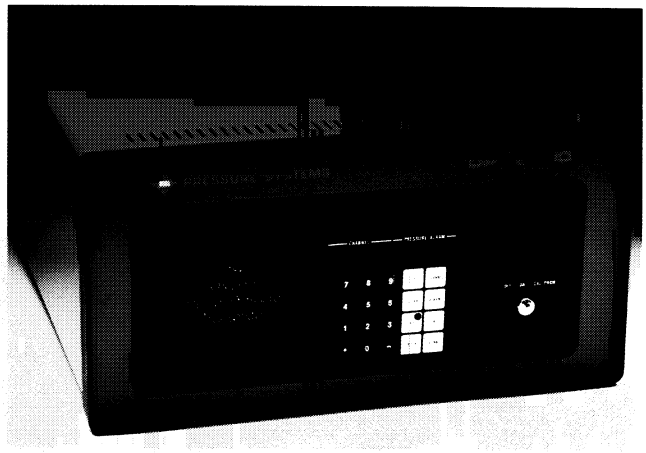


Pressure Measurement

The module pictured below is a system designed to increase productivity in industrial processes where there is need for making multiple pressure measurements quickly and with high accuracy. Called the DPT 6400, it is produced by Pressure Systems Incorporated (PSI), Hampton, Virginia, a spinoff company whose whole product line is based on NASA technology developed for wind tunnel instrumentation.

The DPT 6400 has application in controlling industrial processes in plants that are being upgraded to automated status. Many plants use instrument air "loops" to control the individual valves and actuators throughout the plant; in some plants, there are as many as 3,000 loops. In order to automate such plants, the pressures at the many loops must be measured, converted to digital information, and transmitted to the



plant's process control computer. The DPT 6400 serves that function; by employing solid-state pressure-sensing transducers whose errors are automatically corrected by a microprocessor, it is capable of highly accurate pressure measurements; above, the digital reading (in red) indicates the channel number and the pressure, in pounds per square inch, at the loop being sensed. The basic DPT 6400 has 64 channels, but the system can be expanded to 256 channels by addition of "slave" units.

The DPT 6400 is an outgrowth of electronically scanned pressure (ESP) technology, which was developed at Langley Research Center to meet a need for higher data rates and high accuracy in measuring pressures at a great many points in a wind tunnel; ESP modules provide as many as 20,000 readings a second. At upper left, a Space Shuttle Orbiter model is undergoing wind tunnel testing at Langley for analysis of the shock wave visible in the photo; in tests like this, ESP modules measure the pressure at various points on the module. Along with other test data, ESP readings are displayed in the control room (left); the ESP model is above the technician's head.

Now president of PSI, Douglas Juanarena was an instrument design engineer at Langley and one of the developers of ESP. In 1977, he obtained a NASA license for the technology and formed PSI. In addition to its new industrial-use DPT 6400, the company supplies pressure measurement instrumentation for use in wind tunnels, jet engine test stands and aircraft flight testing; customers include government and aerospace industry laboratories in the U.S. and abroad.